Space Weather Forecast

Issued on Saturday, 24 August 2024 at 01:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High activity with further Moderate flares expected, and a slight chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: High, with eight Moderate class flares in the last 24 hours. The majority of these, including the strongest, was from the small but growing sunspot region on the southwest disc. This has been the source of the majority of the recent flare activity, and consists of a collection of small spots, but does include a one mixed magnetic polarity spot. There are nine sunspot region currently on the disc, with the other main flare source a relatively small and apparently simple region in the west, but with ongoing growth and a number of small surrounding spots. The largest region is in the southwest, and while inactive, this has seen growth within its intermediate spots, where a further mixed magnetic polarity region developed. Other regions of note include the large one in the centre disc, which complexified due to the development of opposite polarity spots on its southern extent, and a further moderately sixed region in the southwest which is generally simpler than the other regions, but has seen a small reverse polarity spot emerge ahead of its strong leader spot,

Two CMEs (coronal mass ejections) of note were observed. One was as a result of a common class flare from a region in the northwest disc, and a nearby eruption of material at around 23/0100UTC. This has been re-assessed as having a chance for a glancing impact late on day 3 (26 Aug). A further eruption of some material also occurred just after 23/1330 UTC off the southwest disc. This has been assessed as likely missing, passing south of Earth.

Solar Wind / Geomagnetic Activity: Slow wind conditions dominated. Solar wind speed was background, between 300 and 400 km/s. Interplanetary Magnetic Field (IMF) was Weak to Moderate. The north-south component was Moderate at times and variable, but with more extended periods of negative directed field (southward). Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate class flares are expected with a slight chance of isolated Strong flares.

Solar Wind /Geomagnetic Activity: The CME from 23/0100UTC has been assessed as passing mainly ahead of Earth, but with a chance of a glancing arrival late on day 3 (26 Aug). There are no other Earth-directed CMEs. Any influence from the fast winds from the northern coronal holes on day 1 (24 Aug) is now expected to be weak, with mainly slow wind conditions dominating. Mainly Quiet geomagnetic activity is expected, with a chance of a spell of Unsettled to Active day 1 (24 Aug) from any fast wind influence and a slight chance of Active to G1 Minor storms from any CME glance on day 3 (26 Aug).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy

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protons) is forecast to remain at background, but with a chance of rising in response to any notable flares, especially from the regions in the western disc. This gives a slight chance of exceeding the S1 Minor Solar Radiation Storm level.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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